

REMARKS

Administrative Overview

Claims 56-76 were examined in the Office action of April 20, 2007, and are pending.

Claims 56, 57, and 65-76 are rejected under 35 U.S.C. 103(a) as allegedly being unpatentable over U.S. Publication No. 2002/0154132 (**Dumesny**) in view of “Seamless texture mapping of subdivision surfaces by model pelting and texture blending,” SIGGRAPH 2000, New York, NY, pp. 471-478, ISBN: 1-58113-208-5 (**Piponi**).

Claims 58-64 are rejected under 35 U.S.C. 103(a) as allegedly being unpatentable over Dumesny and Piponi, and further in view of U.S. Patent No. 6,707,458 (**Leather**).

Without acquiescing to any of the rejections, Applicants amend independent claims 56 and 70 as indicated in the Listing of Claims, further specifying that the user-defined region is arbitrarily-shaped. These amendments are supported in the specification as originally filed, for example, at page 3, lines 12-13, reproduced as follows [emphasis added]:

By performing these mapping methods, it is possible to wrap a 2D texture onto the surface of a 3D virtual object within an arbitrarily-shaped, user-defined region.

No new matter is added. Upon entry of this paper, claims 56-76 will still be pending.

Independent claim 56 is patentable over **Dumesny** in view of **Piponi**

Independent claim 56 is patentable over **Dumesny** in view of **Piponi** because neither reference teaches or suggests application of the claimed method for an arbitrarily-shaped, user-defined region.

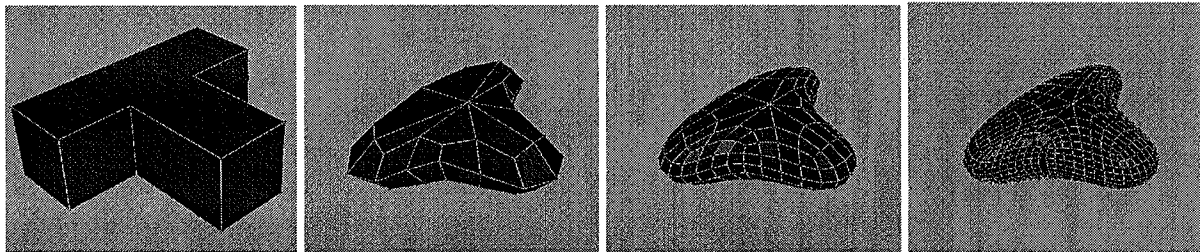
The mapped region in **Dumesny** is not arbitrarily-shaped. As explained in Applicants’ response filed on July 6, 2006, **Dumesny** describes texture mapping methods that require use of mapping functions of fundamental surface topologies (geometric primitives), such as planes, cubes, cylinders, spheres, and cones. **Dumesny** applies its texture mapping techniques to the face of a cube, but the techniques do not work for arbitrarily-shaped, user-defined regions.

Piponi also fails to teach or suggest application of the claimed method for an arbitrarily-shaped, user-defined region. The “subdivision surfaces” of **Piponi** are planar facets of a polygonal mesh defining the entire surface of a 3-D object. The “subdivision surfaces” are not arbitrarily-shaped, user-defined regions because their shapes are governed by a subdivision scheme and, consequently, they are not arbitrarily-shaped and they cannot be drawn, selected, or otherwise defined by a user. They cover the entire surface of a 3-D object, not just a portion of the surface. **Piponi** explains this on page 471, second full paragraph, reproduced as follows:

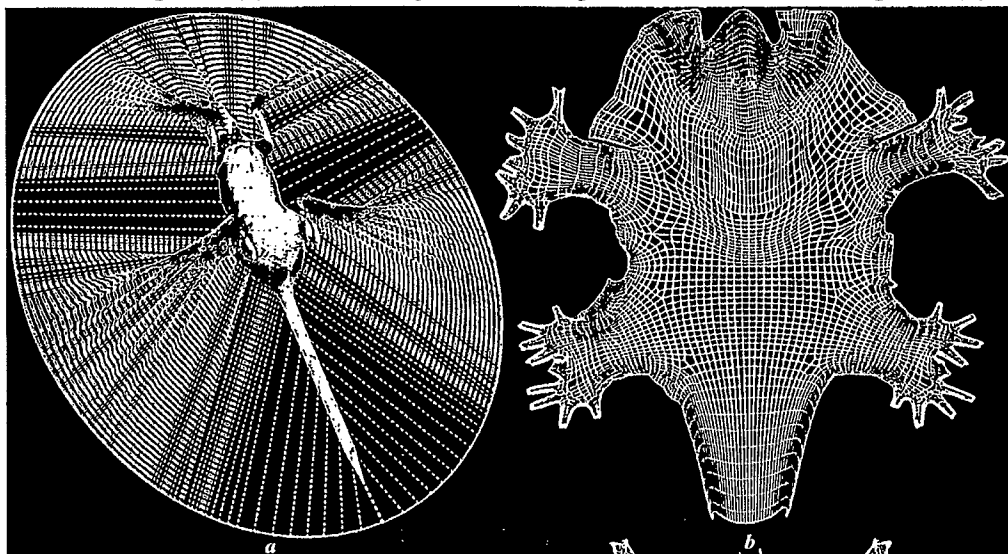
Subdivision surfaces are constructed by starting with a polygonal mesh that forms a manifold, M^0 . A subdivision process is applied to this mesh to produce a new higher resolution mesh M^1 and then this process is iterated to form meshes M^0, M^1, \dots that better approximate the limiting mesh M^∞ [6], [7]. The subdivision scheme is chosen in such a way that under reasonable conditions the limiting surface is smooth.

In this paper we consider only Catmull-Clark surfaces but the techniques extend naturally to other subdivision schemes. (For clarity of exposition we consider mainly Catmull-Clark surfaces derived from quadrilateral meshes. After the first Catmull-Clark refinement any polygonal mesh becomes a quadrilateral mesh anyway [22].)

Piponi uses Catmull-Clark subdivision surfaces to cover an entire 3-D object, prior to “pelting.” For example, the following drawings from the article, “Catmull-Clark Surfaces,” by Kenneth I. Joy,¹ illustrate the application of a Catmull-Clark subdivision scheme to define a polygonal mesh (subdivision surfaces) to cover the surface of a 3-D object:



In **Piponi**, the entire 3-D object is discretized using Catmull-Clark subdivision surfaces, as shown in Figure 4(a), and the object is then “pelted”, as shown in Figure 4(b), reproduced below:



¹ On-Line Geometric Modeling Notes, Department of Computer Science, University of California, Davis (undated), <http://graphics.cs.ucdavis.edu/education/CAGDNotes/Catmull-Clark.pdf>

The prior art neither suggests nor enables adaptation of the techniques of **Dumesny** and/or **Piponi** to the wrapping of a texture onto an arbitrarily-shaped, user-defined region of the surface of a 3-D virtual object, as recited in claim 56 of the present application.

Because none of the cited art, individually or in combination, teaches or suggests every element of claim 56, then claim 56 is patentable over the cited art. Applicants therefore request the reconsideration and withdrawal of the rejection of claim 56 under 35 U.S.C. 103(a).

Dependent claims 57-69 are patentable over the cited art

Likewise, because a dependent claim includes all of the limitations of the independent claim from which it depends, Applicants assert that dependent claims 57-69 are patentable, at least on this basis. Applicants request the reconsideration and withdrawal of the rejections of dependent claims 57-69. Applicants reserve the right to present further arguments regarding the patentability of the dependent claims, should this become necessary. For example, Applicants reserve the right to present further arguments traversing the rejections of dependent claims 58-64.

Independent claim 70 and its dependent claims 71-76 are patentable over **Dumesny** in view of **Piponi**

Claim 70 is an apparatus claim related to the subject matter of claim 56. For the reasons discussed above with respect to claim 56 and its dependent claims, Applicants contend that claim 70 and its dependent claims 71-76 are patentable over the cited art.

CONCLUSION

Applicants contend the claims are in condition for allowance. Applicants respectfully request reconsideration and withdrawal of all rejections, and allowance of claims 56-76 in due course. The Examiner is hereby cordially invited to contact Applicant's undersigned representative by telephone at the number listed below to discuss any outstanding issues.

Respectfully submitted,



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